REMARKS

Applicant, in response to the official action dated December 7, 2009, has amended the claims and presented additional claims to overcome the objections under 35 U.S.C. 112 second paragraph and the rejections under 35 U.S,C, 103. Reconsideration fo the refusal of the claims as presently presented is kindly requested.

Regarding the cited art, the Examiner mainly refers to US 6 054 762 (Sakuraba et al).

It is the object of the US-Patent 6 054 762 is, to provide for improved heat cycle characteristics of a metal-ceramic substrates each comprising a ceramic layer and at least one metal layer which is bonded to the ceramic layer by high temperature bonding at a bonding process temperature higher than 650°C, namely by active soldering process with a process temperature of about 850°C or by DCB bonding process at a bonding temperature of 1063°C.

The metal layer is formed by a copper foil or plate 0.3 mm thick. Because of the very different thermal expansions of copper and a ceramic layer, high mechanical stresses may occur on the joint or border between the ceramic layer and the copper layer, especially at or near the edges or margins of the copper plate or the conductive tracks and conduct surfaces formed by the structured copper plate.

For smoothing or "softening" the edge areas of the copper plate or the conductive tracks and contact surfaces and thereby improving the heat cycle characteristics of the metal ceramic substrates, US 6 054 762 proposes a i.e. multi step edging of the margin- or edge areas, so that stepped edges or margins are obtained, as shown in the figures of US 6 054 762. The intended improvement of heat cycle characteristics is only obtained, if there is a remarkable stepwise reduction of the copper plate thickness in the margin area, so that the actual copper plate thickness t1 or t2 at the outer edge of the copper plate or of the structured areas is only a very small fraction of the maximum thickness or 0.3 mm thickness.

The inventive process is not a process in which the edge areas of a metal layer or of the structured conductive tracks and contact surfaces are treated in a step edging process such that stepped edges or margins are obtained for improving the heat cycle characteristics of the

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The inventive process is not a process in which the edge areas of a metal layer or of the structured conductive tracks and contact surfaces are treated in a step edging process such that stepped edges or margins are obtained for improving the heat cycle characteristics of the

metal ceramic substrate, but during the inventive process, as claimed, a brazing resist coating is applied to the conductive tracks and contact surfaces along the edges of these contact surfaces and conductive tracks (compare page 6, first paragraph of the English translation), so that a brazing compound which is later used during assembling the substrates with electrical components is prevented from flowing into intermediate spaces (6) which are formed in between conductive tracks or paths, contact surfaces or contacts and so on.

The edging step after applying the brazing resist coating to the structured metal layer is performed only for "cleaning" the surfaces of the metal layer and is therefore performed to a small extend, so that only an amount of 0.1 – 20 microns of the thickness of the metal layer is removed. This would never be sufficient to improve the heat cycle characteristics. This also means, that US 6 054 762 does not teach removing 0.1 to 20 microns on the removing or edging step, as the Examiner avers it. When reading US Patnet Number 6 054 762 and considering the disclosure therein and the object to be solved by US 6 054 762, it would not be obvious for a person skilled in art to perform only one edging step so, that only 0.1 to 20 microns are removed, because this would never lead to an improvement of the heat cycle characteristics as intended by the multi step edging disclosed by the US-Patent 6 054 762.

Regarding the present claimed invention, there is only one edging step after the brazing resist coating has been applied to the structured metal layer, furthermore, that brazing resist coating or layer is left on the structured metal layer, whereas the mask of edging resist as used at the known process is removed from the structured metal layer.

Furthermore, US 6 054 762 does not teach applying a brazing resist coating to the structured metal layer and to leave this brazing resist coating on the metal layer after removing some metal from the structured metal layer in the cleaning or edging step. US 6 054 762 teaches applying edging resist layers on the copper plate. Such edging resist layers or the edging resist used for such layers is quite different from the brazing resist. In normal process, the edging resist layers are formed by photo resist material and are suitable for protecting a copper plate against the edging medium. The curing of the photo resist or edging resist is affected by light. The brazing resist coating consists of a material which prevents soldering or brazing compounds used in assembling a substrate with electrical components from flowing into the spaces in between the

conductive path, contact and so on. In the normal process, the brazing resist coating is cured thermally. Therefore, the Examiner is totally wrong in interpreting US 6 054 762 (Sakuraba) and averring that it teaches a brazing resist coating.

In addition to the step edging, US 6 054 762 teaches structuring the copper plate and this may conform to step b) of claims 1 and claim 24. Step d) of claim 1 and 24 is a cleaning step and is performed to reduce the thickness of the structured metal layer in a very small amount of 0.1 – 20 microns to improve the barrier effect of the brazing resist by reducing the thickness of the structured metal layer in surface areas bordering the brazing resist coating.

The new claims 24 – 28 include the limitation to apply the brazing resist coating with a thickness of 0.5 to 100 microns in a strip like manner along edges of the contact tracks and contact surfaces (compare page 6, first paragraph of the translation). The cited art does also not teach neither to apply a brazing resist coating with a thickness of 0.5 to 100 microns nor to apply a brazing resist coating in a strip like manner along edges of the contact tracks and contact surfaces (compare page 6, first paragraph of the translation).

The new claims 27 and 28 include the additional limitation of claim 16. As far as this claim is concerned, the Examiner had referred to US 6 054 762 (Sakuraba) and US 3 429 029 (Langdon) and admitted, that neither Sakuraba nor Langdon teaches applying a metal coating to a surfaces area, which has been produced by removal and adjoins at least one brazing resist coating. Although it could be eventually obvious to a person skilled in art to provide a metal coating on such areas of a structured metallization or of contact surfaces to which electrical components will be later bonded in order to improve the bonding for example by soldering or brazing, but according to the teaching of the invention, it will be necessary to first reduce the thickness of the metal layer in the small amount of 0.1 to 20 microns on such areas in order to safe the barrier effect of the brazing resist coating. In other words, the invention teaches to reduce the thickness of the structured metal layer before applying an additional metal coating adjoining the brazing resist coating.

For clarity purposes, it should also be taken into account, that US 3 429 029 (Langdon) does not teach any process for producing a metal-ceramic substrate, but refers to semiconductor devices and method for producing such devices. Therefore the technical field of

US 3 429 029 is very different from the technical field of the inventive process. Apart from that, US 3 429 029 does not teach either applying a brazing resist coating or applying such a coating on a structured metal layer or structuring the metal layer by masking and edging.

The undersigned urges the office to reconsider the outstanding refusal and approve the claims as filed.

If any questions remain, the undersigned requests the Examiner contact the undersigned for an interview.

Respectfully submitted,

3/5/2010
Date

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